

# Cancer Incidence and Mortality In Massachusetts 1995 - 1999



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Public Health

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**CANCER INCIDENCE AND MORTALITY  
IN MASSACHUSETTS  
1995-1999:  
STATEWIDE REPORT**

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# INTRODUCTION

## Content

This report:

- provides statewide information on cancer incidence in Massachusetts for twenty-three types of cancer and for all cancers combined for 1995 through 1999;
- provides detailed information about the four most commonly occurring types of cancer in males and females for 1995 through 1999;
- reviews Massachusetts cancer incidence trends for 1995 through 1999.

The report is organized into the following four sections:

**METHODS** provides a detailed explanation of the data collection, data processing and statistical techniques employed in this report.

**CANCER INCIDENCE AND MORTALITY IN MASSACHUSETTS** provides an overview of cancer incidence and cancer mortality in Massachusetts from 1995 through 1999.

**TABLES 3 - 8** present data for twenty-three types of cancer, by sex, for 1995-1999.

**Table 3** provides the number of cases, the proportion of all cases, and age-adjusted cancer incidence rates for each cancer type;

**Table 4** presents the number of cases by race/ethnicity;

**Table 5** presents and compares age-adjusted cancer incidence rates by race/ethnicity;

**Table 6** provides the number of deaths, the proportion of all deaths, and age-adjusted cancer mortality rates for each cancer type;

**Table 7** presents the number of deaths by race/ethnicity;

**Table 8** presents and compares age-adjusted cancer mortality rates by race/ethnicity.

**APPENDICES I - IV** provide data supplemental to this report.

**Appendix I** provides a listing of ICD (International Classification of Diseases) codes used for the preparation of this report;

**Appendix II** provides age-adjusted incidence rates for selected cancer sites/types, by sex, for individual years from 1995 through 1999;

**Appendix III** provides age-adjusted mortality rates for selected cancer sites/types, by sex, for individual years from 1995 through 1999;

**Appendix IV** provides age-specific incidence rates for selected sites/types, by sex, for 1995-1999.

## Comparison with Previous Reports

This report updates previous annual reports published by the Massachusetts Cancer Registry (MCR), and also provides a basis for comparison of cancer information to be contained in future reports.

Please note that this report uses a new standard population for calculating age-adjusted rates (see New Features). Previous **Statewide Reports** used a different standard population. Therefore, the age-adjusted rates presented in this report should not be compared to those presented in previous **Statewide Reports**. However, numbers (counts) in this report may be compared to those presented in previous reports.

This **Statewide Report** provides cancer incidence and mortality information for 1995-1999. The most recent **City/Town Supplement**, which contains standardized incidence ratios for selected cancers for the 351 cities and towns in Massachusetts for the period 1994-1998, was released via the Internet in October, 2001 and may be found at [www.state.ma.us/dph/bhsre/MCR/98/supplement/supplement98.htm](http://www.state.ma.us/dph/bhsre/MCR/98/supplement/supplement98.htm).

## New Features

For the first time, this report contains data by race and ethnicity. The race/ethnicity categories presented in this report are mutually exclusive. Cases and deaths are only included in one race/ethnicity category. Individuals of Hispanic ethnicity are not included in a race group. The race/ethnicity tables include the categories white, non-Hispanic; black, non-Hispanic; Asian, non-Hispanic; and Hispanic. Race/ethnicity data should be interpreted with caution due to misclassification and/or under-reporting of the data (See Data Limitations).

This report uses the 2000 U.S. population distribution as a new standard for age-adjustment of rates. Changing the standard population has affected the magnitude of the rates. Because rates can only be compared if they have been adjusted to the same standard, the age-adjusted cancer incidence and mortality rates presented in this report cannot be compared with those from any other publication which used a different standard (see Methods).

This year, national cancer incidence data for 1995-1999 will not be available in time for the release of this report. Previous national data (1994-1998 and earlier) cannot be compared to Massachusetts data for 1995-1999 because of differences in the standard population used for age-adjustment of rates. As a result of these two situations, a comparison between Massachusetts and the nation is not included in this report.

## METHODS

### Data Collection

The MCR collects reports of all newly diagnosed cancer cases from all Massachusetts acute care hospitals and one medical practice association (76 reporting facilities in 1999). The MCR compiles summaries of cancer incidence, such as this report, and also produces special reports. These undertakings require data collection efforts that necessitate extensive interaction with hospital tumor registrars. Intensive data evaluation is also required to ensure data quality. The fundamental requirements of any central cancer registry include:

(1) complete registration, (2) prevention of duplication, (3) collection of uniform data (i.e., standardization of items, definitions, rules, classification and nomenclature of primary site, histology, staging and procedures), (4) quality control and (5) efficient data processing.

The Massachusetts data summarized in this report are drawn from data entered on MCR computer files on or before December 1, 2001 and from death clearance activities completed in October 2001 (see below). The numbers herein may change slightly in future reports, reflecting late reported cases or corrections based on subsequent details from the reporting facilities. Such changes might result in slight differences in numbers and rates in future reports of MCR data. This is the nature of population-based cancer registries, which receive case reports on an ongoing basis.

The MCR began conducting “death clearance” in 1999 in order to identify cases of cancer reported on death certificates which had not been reported to the MCR. In conducting death clearance, the MCR database was linked with that of the Massachusetts Department of Public Health’s Registry of Vital Records and Statistics (1997-1999 resident deaths only). This was done to identify death certificates with any mention of cancer that do not match previously reported cases. These records were then followed back to determine if the cases met MCR reporting requirements. If they should have been submitted by a reporting facility, information was obtained from that facility, and the case was added to the MCR database. Cases for which the death certificate provided the only information regarding a diagnosis of cancer were also added to the database for 1997-1999, and are referred to as “death certificate only” cases. This addition of cases results in changes in 1997-1999 rates, particularly for those cancers with poor survival rates, such as liver cancer and pancreatic cancer (see p. 11).

MCR case ascertainment improved during the years covered by this report. For diagnosis year 1997-1999, the MCR’s total case count was estimated by the North American Association of Central Cancer Registries to be complete.

Coding for primary sites in this report follows the International Classification of Diseases for Oncology (ICD-O, Second Edition) system. The list of reportable neoplasms is the same as that used for SEER program data. However, SEER includes *in situ* bladder cancer cases in its age-adjusted bladder cancer incidence rates; but the MCR does not. The MCR began collecting data on *in situ* neoplasms diagnosed as of January 1, 1992; however, *in situ* cases are not included in this report. As a standard, published incidence rates do not combine

invasive and *in situ* cancers due to differences in the biologic significance of the tumors. Invasive tumors have the potential to be life threatening, and therefore have a significant impact on survival. One reason more and more cancers are detected at the *in situ* stage is advances in diagnostic technology.

## **Data Presentation**

### ***Time Periods***

This publication focuses on cancer incidence and mortality in Massachusetts for the time period 1995-1999. Other cancer data presented here may encompass different aggregate years because of availability at the time of publication.

### ***Age-Adjusted Rates***

Massachusetts statewide incidence and mortality rates are sex-specific, age-adjusted rates per 100,000 population, and are calculated by the direct method using the 2000 U.S. Bureau of the Census population distribution as the standard. Rates are age-adjusted using 18 five-year age groups to correct for differences in the age distributions of different populations.

The 2000 U.S. population distribution is a new standard population for age-adjustment of rates. Previously, the 1970 U.S. population distribution was used for age-adjustment of rates by SEER and for this report. The new 2000 standard has been adopted by Federal agencies to promote uniformity and comparability of data from many organizations. Changing the standard population from 1970 to the year 2000 has affected the magnitude of age-adjusted rates. Only rates adjusted to the same standard can be compared. **Therefore, age-adjusted rates published in this report cannot be compared to previously published age-adjusted rates which use the 1970 U.S. standard population** (BHSRE, 2001). It is also important to note that differences in methodologies used in calculating rates, such as number of age groups used, may cause slight variations in results.

For the computation of Massachusetts age-adjusted incidence and mortality rates in this report, the statewide population for individual years is based on population estimates released by the Massachusetts Institute for Social and Economic Research (MISER) in September, 2000. For reports prior to *Cancer Incidence in Massachusetts, 1982-1989*, the statewide population for individual years was derived from estimates based on 1980 U.S. Bureau of the Census counts and 1990 projections obtained from MISER. If rate comparisons are made to any of these prior reports, data may vary slightly due to these population adjustments.

### ***Age-Specific Rates***

Massachusetts statewide age- and sex-specific rates per 100,000 residents are given for twenty-three selected types of cancer and all types of cancer combined in Appendix IV.

### ***Mortality Data***

Beginning with data year 1999, a new revision for classifying causes of death has been implemented. The International Classification of Disease, Tenth Revision (ICD-10) has replaced the International Classification of Diseases, Ninth Revision (ICD-9) for coding all mortality data. Because of differences in the coding between ICD-9 and ICD-10, direct comparisons of causes of death between 1999 and previous years cannot be made. Any comparison needs to take into account changes in the classification system. To help make comparisons, the National Center for Health Statistics has provided preliminary comparability ratios (Kochanek *et al.*, 2001) for leading causes of death. These comparability ratios are multipliers to adjust for changes in how data are classified between the two revisions of ICD (BHSRE, 2001). All 1995-1998 mortality data presented in this report have been modified using the comparability ratios so that they can be combined or compared with 1999 mortality data. For more information about comparability ratios, please see the Massachusetts Department of Public Health's publication, *Massachusetts Deaths 1999*, which can be found at [www.state.ma.us/dph/bhsre/death/99/death99.pdf](http://www.state.ma.us/dph/bhsre/death/99/death99.pdf).

## **Data Limitations**

Four limitations must be considered when interpreting cancer incidence data in this report: under-reporting in areas close to neighboring states; under-reporting for cancers that may not be diagnosed in hospitals; minor incidence changes resulting in misleadingly large percent differences for rare types of cancer; and misclassification and/or under-reporting of race/ethnicity.

### ***Border Areas and Neighboring States***

Some areas of Massachusetts appear to have low cancer incidence, but this may be due to loss of cases in Massachusetts residents who were diagnosed in neighboring states and not reported to the MCR. Presently the MCR has reciprocal reporting agreements with the following fifteen states: Alaska, Arkansas, Connecticut, Florida, Maine, Mississippi, New Hampshire, New York, North Carolina, Rhode Island, South Carolina, Texas, Vermont, Wisconsin and Wyoming.

### ***Cases Diagnosed in Non-Hospital Settings***

During the time period covered by this report (1995 through 1999), the MCR's information sources for nearly all newly diagnosed cases of cancer were hospitals. Some types of cancer in this report may be under-reported because they are diagnosed by private physicians, private laboratories, health maintenance organizations or radiotherapy centers that escape the case identification systems used by hospitals. Particular examples include melanoma of the skin, prostate cancer and certain hematologic malignancies such as leukemia and multiple myeloma. The extent of this under-reporting has not been determined exactly, but cases included in this report represent the great majority of cases statewide and provide an essential basis for observing statewide cancer incidence patterns.

### ***Percent Differences***

The interpretation of percent increases or decreases should be viewed with caution. Apparent increases or decreases in cancer incidence over time may reflect changes in diagnostic methods or case reporting rather than true changes in cancer occurrence. Also, a percent increase or decrease in cases for a cancer with a higher incidence rate has greater public health significance, since larger numbers of patients are affected. For a cancer with a base incidence rate of 100 cases per 100,000 residents, an increase of 25% adds 25 cases per 100,000; for a rarer cancer with a base rate of 8 cases per 100,000, the same increase (25%) adds 2 cases per 100,000.

### ***Race/Ethnicity Data***

Data on race/ethnicity is based on information existing in the medical record for cancer cases and information on the death certificate for cancer deaths. Errors in these source documents may lead to incorrect classification of race/ethnicity. Also, some race/ethnicity categories may be under-reported since race/ethnicity is not available for all cases. Counts and rates may under-represent the true incidence of some race/ethnic populations.

## CANCER INCIDENCE AND MORTALITY IN MASSACHUSETTS

### Cancer Incidence and Mortality (1995-1999)

In Massachusetts, from 1995 through 1999, there were 156,735<sup>1</sup> newly diagnosed cases of cancer – 77,922 in males and 78,787 in females (Figure 1).

For all types of cancer combined for 1995-1999, the average annual age-adjusted incidence rate among males was 590.4 cases per 100,000 (Table 3). The most commonly diagnosed type of cancer in Massachusetts males for this time period was prostate cancer, followed by cancer of the bronchus and lung, colon/rectum and urinary bladder (Figure 1). There were 23,720 cases of prostate cancer reported from 1995-1999, accounting for 30% of all cancers diagnosed in Massachusetts males and an age-adjusted incidence rate of 179.1 cases per 100,000 (Table 3).

For all types of cancer combined for 1995-1999, the average annual age-adjusted incidence rate among females was 442.7 cases per 100,000 (Table 3). Among Massachusetts females, the most commonly diagnosed cancer types were cancers of the breast, bronchus and lung, colon/rectum, and corpus uteri (uterus) (Figure 1). There were 24,919 cases of breast cancer reported from 1995-1999, accounting for 32% of all cancers diagnosed in females and an age-adjusted incidence rate of 145.3 cases per 100,000 (Table 3).

In both sexes, the four leading types of cancer comprised approximately 63% of all new cancer cases for this time period (Figure 1). No other type of cancer constituted more than 5% of new cases in either sex.

Although prostate cancer and breast cancer were the most commonly diagnosed cancers in Massachusetts males and females, respectively, these cancers ranked second in mortality for each sex. Cancer of the bronchus and lung was the leading cause of cancer death for both males and females between 1995 and 1999 (Figure 2). During this time period, cancer of the bronchus and lung accounted for 29% of all cancer deaths and an age-adjusted mortality rate of 77.6 per 100,000 in males and 23% of all cancer deaths and an age-adjusted mortality rate of 43.7 per 100,000 in females (Table 6). The third and fourth most common types of cancer death in Massachusetts males and females for 1995-1999 were cancers of the colon/rectum and pancreas (Figure 2).

In both sexes, the four leading types of cancer comprised approximately 56% to 57% of all cancer deaths for this time period (Figure 2). No other type of cancer constituted more than 5% of cancer deaths in either sex.

For all types of cancer combined for 1995-1999, black, non-Hispanics had the highest age-adjusted incidence rate among Massachusetts males (706.9 cases per 100,000) (Table 5).

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<sup>1</sup> The male and female case counts will not add up to the total case count because the MCR added two additional gender classifications (transsexuals and persons with sex chromosome abnormalities/hermaphrodites) for cases diagnosed as of January 1, 1995. Cases diagnosed before this date were limited to male or female only.

The top three most commonly diagnosed cancers were the same for all Massachusetts male race/ethnicity categories. These top three cancers were prostate cancer, followed by cancers of the bronchus and lung and colon/rectum. The cancer that ranked fourth for Massachusetts males varied by race/ethnicity. The fourth most commonly diagnosed cancer was cancer of the urinary bladder for white, non-Hispanic males, stomach cancer for black, non-Hispanic males, cancer of the liver and intrahepatic bile ducts for Asian, non-Hispanic males, and cancer of the oral cavity and pharynx for Hispanic males (Table 1).

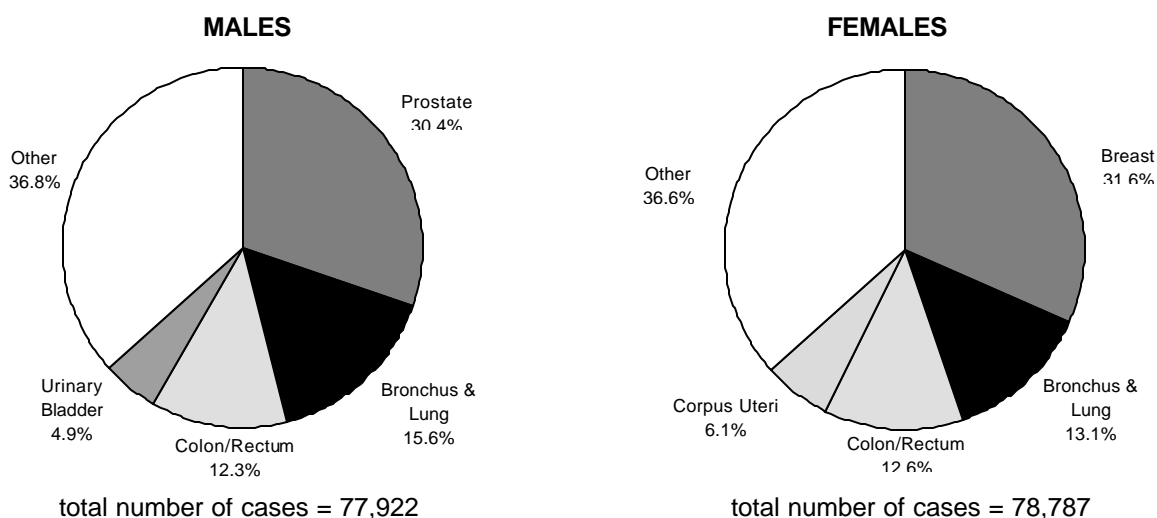
For all types of cancer combined for 1995-1999, white, non-Hispanics had the highest age-adjusted incidence rate among Massachusetts females (439.7 cases per 100,000) (Table 5). Among Massachusetts females, the top four most commonly diagnosed cancers were the same by race/ethnicity, but the rank order of the second and third leading cancers varied. Breast cancer was the most commonly diagnosed cancer for all race/ethnicities, and cancer of the corpus uteri and uterus, not otherwise specified was the fourth most common cancer for all race/ethnicities. Cancer of the bronchus and lung was the second leading cancer for white, non-Hispanic and black, non-Hispanic females, but the third leading cancer for Asian, non-Hispanic and Hispanic females. Cancer of the colon/rectum was the third leading cancer for white, non-Hispanic and black, non-Hispanic females, but the second leading cancer for Asian, non-Hispanic and Hispanic females (Table 1).

For all types of cancer combined for 1995-1999, black, non-Hispanics had the highest age-adjusted mortality rate among males, with 388.1 deaths per 100,000 males (Table 8). For Massachusetts males, cancer of the bronchus and lung was the most common cause of cancer death among all race/ethnicities. Cancer of the prostate and colon/rectum were the second and third leading causes of cancer death, respectively, among white, non-Hispanic, black, non-Hispanic, and Hispanic males. Cancer of the liver and intrahepatic bile ducts ranked the second leading cause of cancer death for Asian, non-Hispanic males (Table 2).

For all types of cancer combined for 1995-1999, black, non-Hispanic females had the highest age-adjusted mortality rate with 233.6 deaths per 100,000 females (Table 8). Cancer of the bronchus and lung was the most common cause of cancer death among all female race/ethnicities, except Hispanic females. Breast cancer was the leading cause of death for Hispanic females. Cancers of the breast and colon/rectum were the second and third leading causes of cancer death, respectively, among white, non-Hispanic, black, non-Hispanic, and Asian, non-Hispanic females. The second and third leading causes of cancer death for Hispanic females were cancers of the colon/rectum and bronchus and lung, respectively (Table 2).



**Figure 1**  
**DISTRIBUTION OF CANCER INCIDENCE BY CANCER TYPE AND SEX**  
**Massachusetts, 1995-1999**



Data for the four leading types of newly diagnosed cancers among males and females for 1995-1999 are summarized below by race/ethnicity.

**Table 1**  
**LEADING CANCERS BY SEX AND RACE/ETHNICITY**  
**Massachusetts, 1995-1999**

**M A L E S**

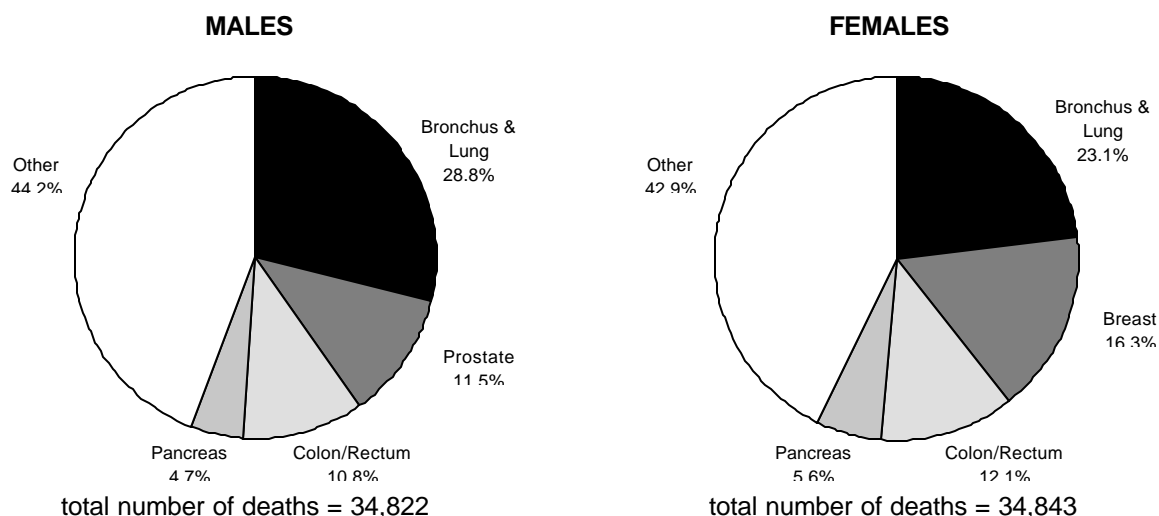
RANK	AGE-ADJUSTED <sup>1</sup> INCIDENCE RATE <sup>2</sup> (% OF ALL CASES)			
	White, non-Hispanic	Black, non-Hispanic	Asian, non-Hispanic	Hispanic
1	Prostate 172.6 (30.0%)	Prostate 293.6 (39.9%)	Prostate 95.3 (21.0%)	Prostate 141.7 (28.6%)
2	Bronchus & Lung 92.4 (15.9%)	Bronchus & Lung 109.6 (14.7%)	Bronchus & Lung 73.1 (16.5%)	Bronchus & Lung 58.0 (12.7%)
3	Colon/Rectum 74.5 (12.5%)	Colon/Rectum 76.9 (10.1%)	Colon/Rectum 43.0 (9.9%)	Colon/Rectum 40.8 (8.4%)
4	Urinary Bladder 31.0 (5.2%)	Stomach 24.1 (3.4%)	Liver & Intrahepatic Bile Ducts 24.0 (7.3%)	Oral Cavity & Pharynx 19.6 (5.1%)

**F E M A L E S**

RANK	AGE-ADJUSTED <sup>1</sup> INCIDENCE RATE <sup>2</sup> (% OF ALL CASES)			
	White, non-Hispanic	Black, non-Hispanic	Asian, non-Hispanic	Hispanic
1	Breast 145.4 (31.7%)	Breast 113.7 (30.0%)	Breast 81.6 (28.3%)	Breast 82.3 (29.1%)
2	Bronchus & Lung 58.1 (13.4%)	Bronchus & Lung 48.9 (12.2%)	Colon/Rectum 46.4 (11.7%)	Colon/Rectum 27.4 (8.5%)
3	Colon/Rectum 50.9 (12.8%)	Colon/Rectum 47.8 (11.8%)	Bronchus & Lung 35.6 (9.2%)	Bronchus & Lung 21.9 (6.7%)
4	Corpus Uteri & Uterus, NOS 28.2 (6.1%)	Corpus Uteri & Uterus, NOS 20.4 (5.0%)	Corpus Uteri & Uterus, NOS 15.2 (4.8%)	Corpus Uteri & Uterus, NOS 17.9 (6.3%)

<sup>1</sup> age-adjusted to the 2000 U.S. Standard Population <sup>2</sup> per 100,000

**Figure 2**  
**DISTRIBUTION OF CANCER MORTALITY BY CANCER TYPE AND SEX**  
**Massachusetts, 1995-1999**



Data for the four leading types of cancer deaths among males and females for 1995-1999 are summarized below by race/ethnicity.

**Table 2**  
**LEADING CANCER DEATHS BY SEX AND RACE/ETHNICITY**  
**Massachusetts, 1995-1999**

**M A L E S**

RANK	AGE-ADJUSTED <sup>1</sup> MORTALITY RATE <sup>2</sup> (% OF ALL CASES)			
	White, non-Hispanic	Black, non-Hispanic	Asian, non-Hispanic	Hispanic
1	Bronchus & Lung 78.5 (29.0%)	Bronchus & Lung 98.8 (26.0%)	Bronchus & Lung 50.2 (26.0%)	Bronchus & Lung 29.1 (20.0%)
2	Prostate 33.9 (11.4%)	Prostate 69.6 (14.8%)	Liver & Intrahepatic Bile Ducts 18.9 (12.7%)	Prostate 20.2 (10.3%)
3	Colon/Rectum 30.5 (10.9%)	Colon/Rectum 43.3 (10.7%)	Prostate 18.4 (6.2%)	Colon/Rectum 13.6 (9.0%)
4	Pancreas 12.9 (4.7%)	Pancreas 19.1 (5.4%)	Stomach 15.6 (7.3%)	Esophagus 7.7 (4.6%)

**F E M A L E S**

RANK	AGE-ADJUSTED <sup>1</sup> MORTALITY RATE <sup>2</sup> (% OF ALL CASES)			
	White, non-Hispanic	Black, non-Hispanic	Asian, non-Hispanic	Hispanic
1	Bronchus & Lung 44.8 (23.4%)	Bronchus & Lung 45.6 (19.3%)	Bronchus & Lung 25.5 (16.4%)	Breast 12.6 (17.3%)
2	Breast 31.1 (16.3%)	Breast 38.2 (16.9%)	Breast 16.8 (13.6%)	Colon/Rectum 10.9 (13.5%)
3	Colon/Rectum 20.6 (12.1%)	Colon/Rectum 28.3 (11.9%)	Colon/Rectum 16.7 (11.0%)	Bronchus & Lung 9.2 (11.4%)
4	Pancreas 10.1 (5.7%)	Pancreas 15.3 (6.3%)	Stomach 10.3 (7.9%)	Non-Hodgkin's Lymphoma 5.2 (7.3%)

<sup>1</sup> age-adjusted to the 2000 U.S. Standard Population <sup>2</sup> per 100,000

## Cancer Incidence and Mortality Trends

### Incidence

When incidence rates are compared for the two endpoints of this report (1995 and 1999), overall cancer incidence increased 2.4% (0.9% in males, and 3.4% in females). It is important to note, however, that rates for 1997-1999 also include cases identified only on death certificates, which had not been done in previous years. This addition of cases elevated incidence rates by 10% or more for certain cancers, such as pancreatic cancer and liver cancer, which have shorter survival times and may not be diagnosed prior to death. Rates for 1997-1999 may not be directly comparable to those for previous years because of this inclusion of “death certificate only” cases. Incidence patterns may appear different than expected, with some cancers exhibiting no change in – or even overall increases in – incidence rates despite prior trends downward.

Incidence trends in the leading cancers affecting Massachusetts men and women are discussed below. (See Appendix II for the age-adjusted incidence rates presented below, and Figures 3A, 3B, 4A, and 4B for a more detailed summary of incidence and mortality trends for the leading cancers and others discussed below.)

### Males

Among Massachusetts males, prostate cancer increased 5.7% between 1995 and 1999 (see Figure 3A). The 1995 incidence rate was 173.7 cases per 100,000 males, and the 1999 rate increased to 183.6 cases per 100,000 males. Devesa *et al.* (1995; see REFERENCES) attribute national increases in prostate cancer incidence during the late 1980s and early 1990s to changes in diagnostic methodology. Transurethral resections were performed more frequently in the 1980s than in the preceding decade, resulting in increased detection of cases which would have been undetectable by clinical means. Other diagnostic procedures (such as serum testing for prostate-specific antigen (PSA), ultrasound-guided needle biopsy, computed axial tomography (CAT scanning) and bone scanning) have also increased the number of prostate cancer diagnoses in recent years. Wingo *et al.* (1998; see REFERENCES) attribute the more recent downtrends in prostate cancer (since 1992) to the identification of prevalent cases through screening, and then the subsequent falling toward an equilibrium, reflecting only incident cases in the population. Also, there may have been decreased utilization of PSA screening tests in recent years, which might have been precipitated by recommendations by some organizations against their widespread use during the early 1990s. Although the Massachusetts rate has increased between 1995 and 1999, there still has been an overall decrease from its peak incidence of 217.4 per 100,000 in 1992. While there have been fluctuations, the prostate cancer rate seems to be stabilizing. Howe *et al.* (2001; see REFERENCES) attribute geographic variation in prostate cancer incidence rates to differences in PSA screening. Regions that have high PSA screening rates have high incidence rates, most likely because of the discovery of tumors that would otherwise escape detection.

Age-adjusted incidence rates declined for the second and third most commonly diagnosed cancers in males. The incidence rate for cancer of the bronchus and lung fell slightly from 91.0 cases per 100,000 males in 1995 to 90.5 cases per 100,000 in 1999, a decrease of 0.5% (see Figure 3A). Howe *et al.* (2001) attribute the decrease in lung cancer incidence in males to reduction in tobacco smoking since the 1960s.

The incidence rate of colo-rectal cancer fell from 72.9 cases per 100,000 males in 1995 to 71.9 cases per 100,000 in 1999, a decrease of 1.4% (see Figure 3A). Troisi *et al.* (1999; see REFERENCES) used SEER data to show overall decreases in the incidence rates of colo-rectal cancer. They noted stage-specific shifts which they attributed to earlier detection, most likely due to screening. Howe *et al.* (2001) note that since early-detection methods, such as fecal occult blood test, sigmoidoscopy, colonoscopy, and barium enema, can detect pre-cancerous polyps and early-stage carcinomas, it is difficult to separate the effects of screening from true changes in the incidence of colo-rectal cancer.

The incidence of non-Hodgkin's lymphoma among Massachusetts males decreased from 23.8 cases per 100,000 males in 1995 to 22.9 cases per 100,000 males in 1999, a decrease of 3.8% (see Figure 3A). Devesa *et al.* (1995) attribute the rise in national incidence rates during the early 1990s to changes in case classification, greater exposure to potential causative agents, and the increasing incidence of AIDS-related lymphomas. The rate of increase in non-Hodgkin's lymphomas, however, has slowed in recent years. Wingo *et al.* (1998; see REFERENCES) attribute this to the beneficial effects of antiretroviral therapies on the rate of HIV progression.

Incidence of melanoma of the skin continued to increase among Massachusetts males. In 1995, 17.2 males per 100,000 were diagnosed with melanoma of the skin. By 1999, the incidence rate had risen to 20.2 per 100,000, an increase of 17.4% (see Figure 3A). Devesa *et al.* (1995) attribute this rise in incidence to increased exposure to solar radiation due to changing recreational and clothing habits. Howe *et al.* (2001) also note that earlier detection of melanoma in younger populations could be contributing to the increasing incidence trends.

## Females

Among Massachusetts females, breast cancer incidence increased between 1995 and 1999 (see Figure 3B). The incidence rate increased from 143.6 cases per 100,000 females in 1995 to 146.1 cases per 100,000 in 1999, an increase of 1.7%. Devesa *et al.* (1995) attribute most of the increase in national breast cancer incidence to the earlier detection of tumors resulting from increasing use of mammography and other screening techniques. Other contributing factors may include changes in diet, alcohol consumption, the long-term use of hormone replacement therapy, and certain reproductive variables (such as later age at first childbirth).

The incidence of cancers of the bronchus and lung continues to increase among Massachusetts females, rising from 54.8 cases per 100,000 females in 1995 to 59.0 cases per 100,000 in 1999, an increase of 7.7% (see Figure 3B). Wingo *et al.* (1999) noted that the prevalence of smoking in women has lagged behind that in men, reaching a peak of 55% in

the cohort of women born between 1935 and 1944. Consequently, the incidence of lung cancer is still increasing in women, reflecting the historical pattern of cigarette smoking.

The third most common cancer among Massachusetts females, colo-rectal cancer, was stable at approximately 51 cases per 100,000 for both 1995 and 1999 (see Figure 3B). Uterine cancer, the fourth most common cancer among Massachusetts females, increased from 1995 to 1999 (see Figure 3B). The 1995 incidence rate of 27.9 cases per 100,000 females rose to 29.1 cases per 100,000 in 1999, an increase of 4.3%. Similar to males, the incidence of melanoma increased from 1995 to 1999 among Massachusetts females. The incidence rate rose 31.4% from 10.5 cases per 100,000 females in 1995 to 13.8 cases per 100,000 females in 1999. The reasons for the increase in melanoma incidence among females are similar to the reasons for the increase in melanoma incidence among males.

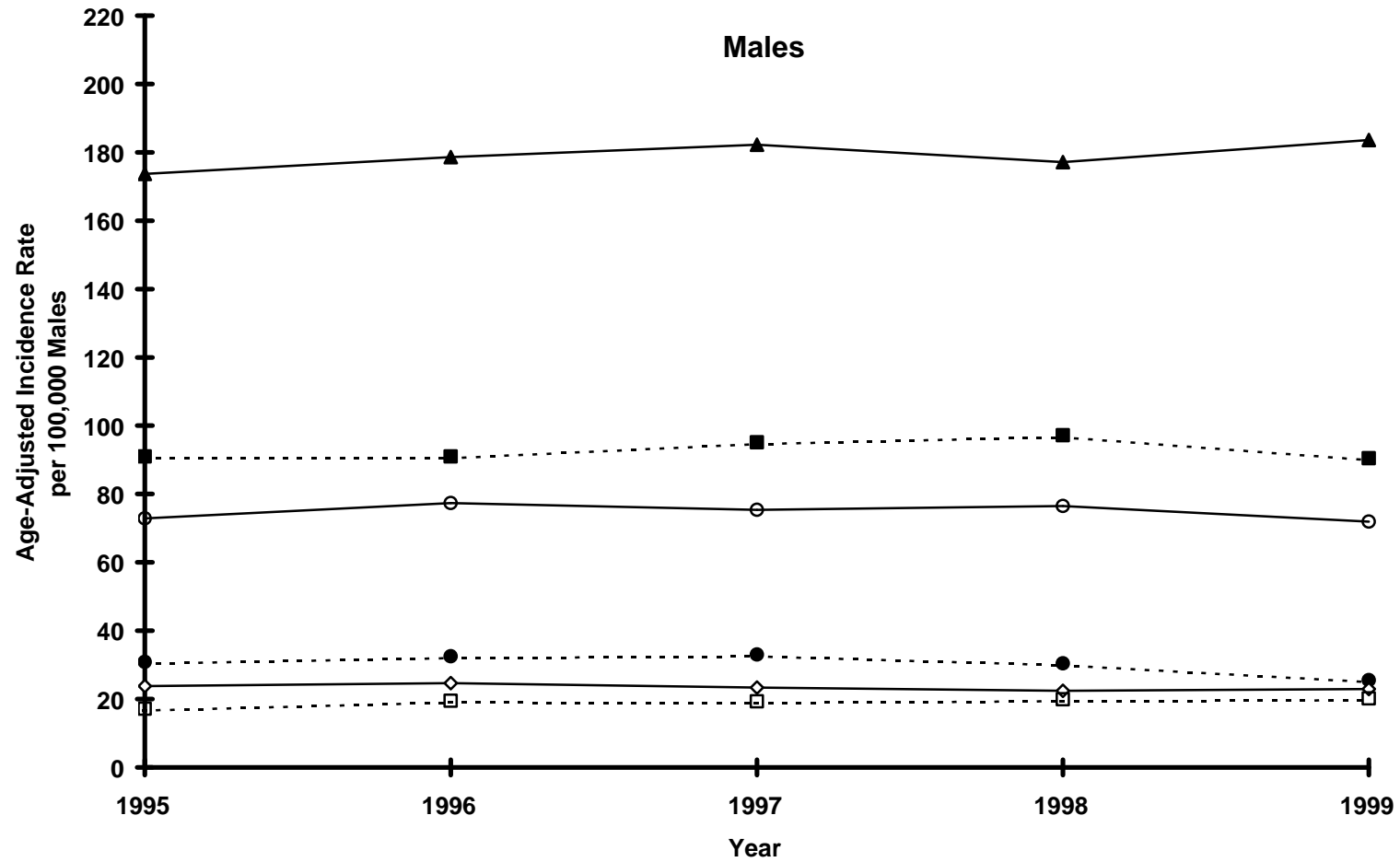
## **Mortality**

When cancer mortality rates are compared for the two endpoints of this report (1995 and 1999), certain changes are notable. For males, decreasing death rates have been observed nationally and in Massachusetts for lung and prostate cancers (see Figure 4A). Wingo *et al.* (1999) attribute decreasing national lung cancer mortality rates in men to decreased smoking rates over the past thirty years. The decrease in smoking among women, however, has lagged behind that of men. For Massachusetts females, lung cancer replaced breast cancer as the leading cause of cancer deaths in 1989. While female lung cancer death rates have begun to stabilize, breast cancer death rates have continued to decrease (see Figure 4B). Wingo *et al.* (1998) attribute the downtrend in national breast cancer mortality to the incorporation of breast cancer screening into routine medical care. Advances in the treatment of breast cancer also contribute to the decline in breast cancer mortality.

For colo-rectal cancer, the decreases in mortality among males and females are not well understood (see Figures 4A and 4B). Wingo *et al.* (1998) suggest several possibilities for the decreases in incidence and mortality of colo-rectal cancer, including increased polyp removal, advances in treatment protocols (e.g., new surgical techniques and adjuvant therapies), and other factors, such as changes in dietary patterns. The explanation for the decline in prostate cancer mortality is also uncertain (see Figure 4A). According to Howe *et al.* (2001), it is not yet known how PSA screening will effect prostate cancer mortality due to other simultaneous changes, such as earlier stages of disease at diagnosis and more aggressive treatment of early disease.

Figure 3A

Massachusetts Cancer Incidence Trends  
for Selected Cancer Types, 1995-1999

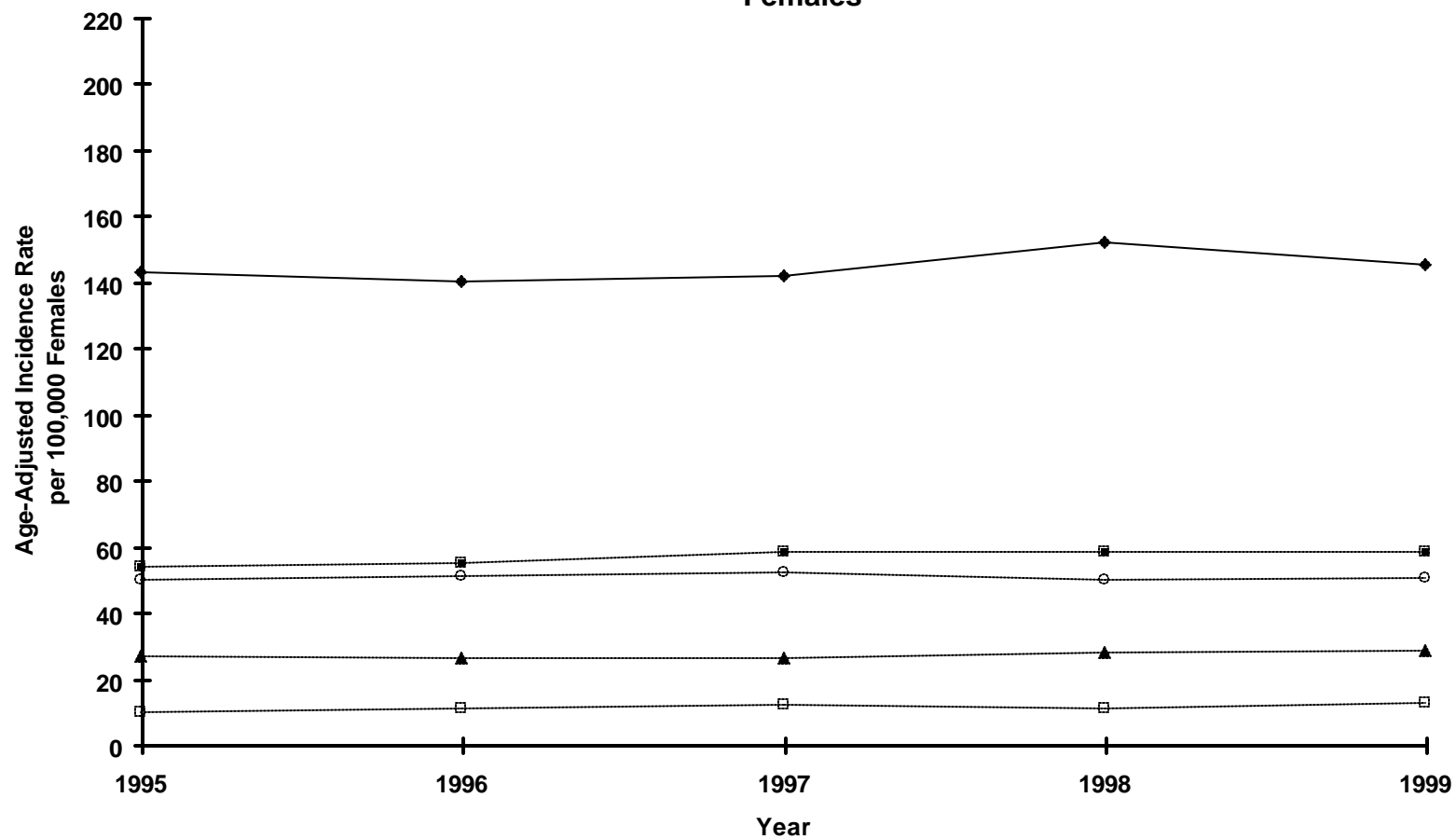


—▲— Prostate    - - ■ - - Bronchus & Lung    —○— Colon / Rectum    - - ● - - Urinary Bladder    —◇— Non-Hodgkin's Lymphoma    - - □ - - Melanoma of Skin

Figure 3B

Massachusetts Cancer Incidence Trends  
for Selected Cancer Types, 1995-1999

Females



—◆— Breast    —■— Bronchus & Lung    —○— Colon / Rectum    —▲— Corpus Uteri    —□— Melanoma of Skin

Figure 4A

Massachusetts Cancer Mortality Trends  
for Selected Cancer Types, 1995-1999

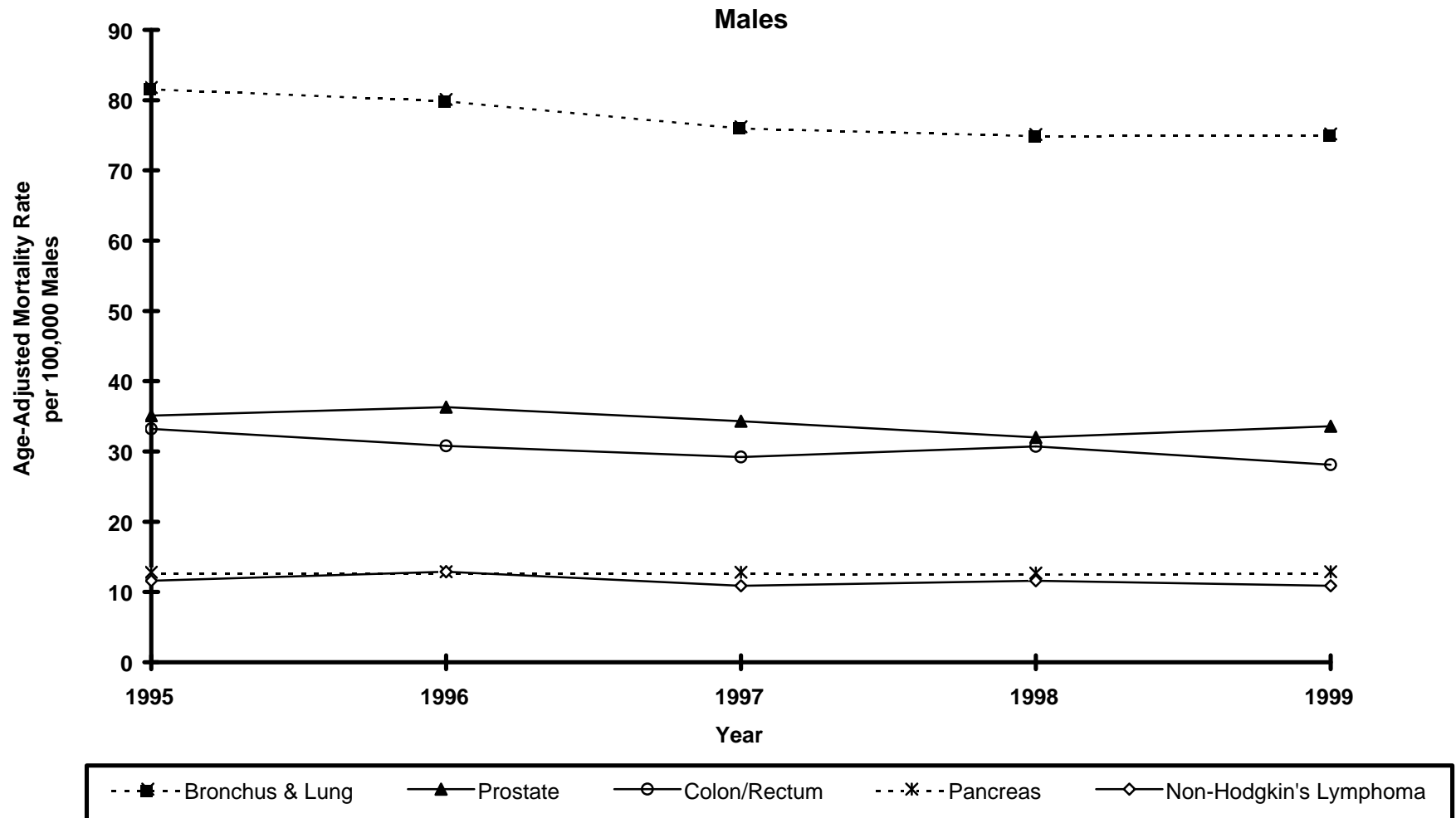
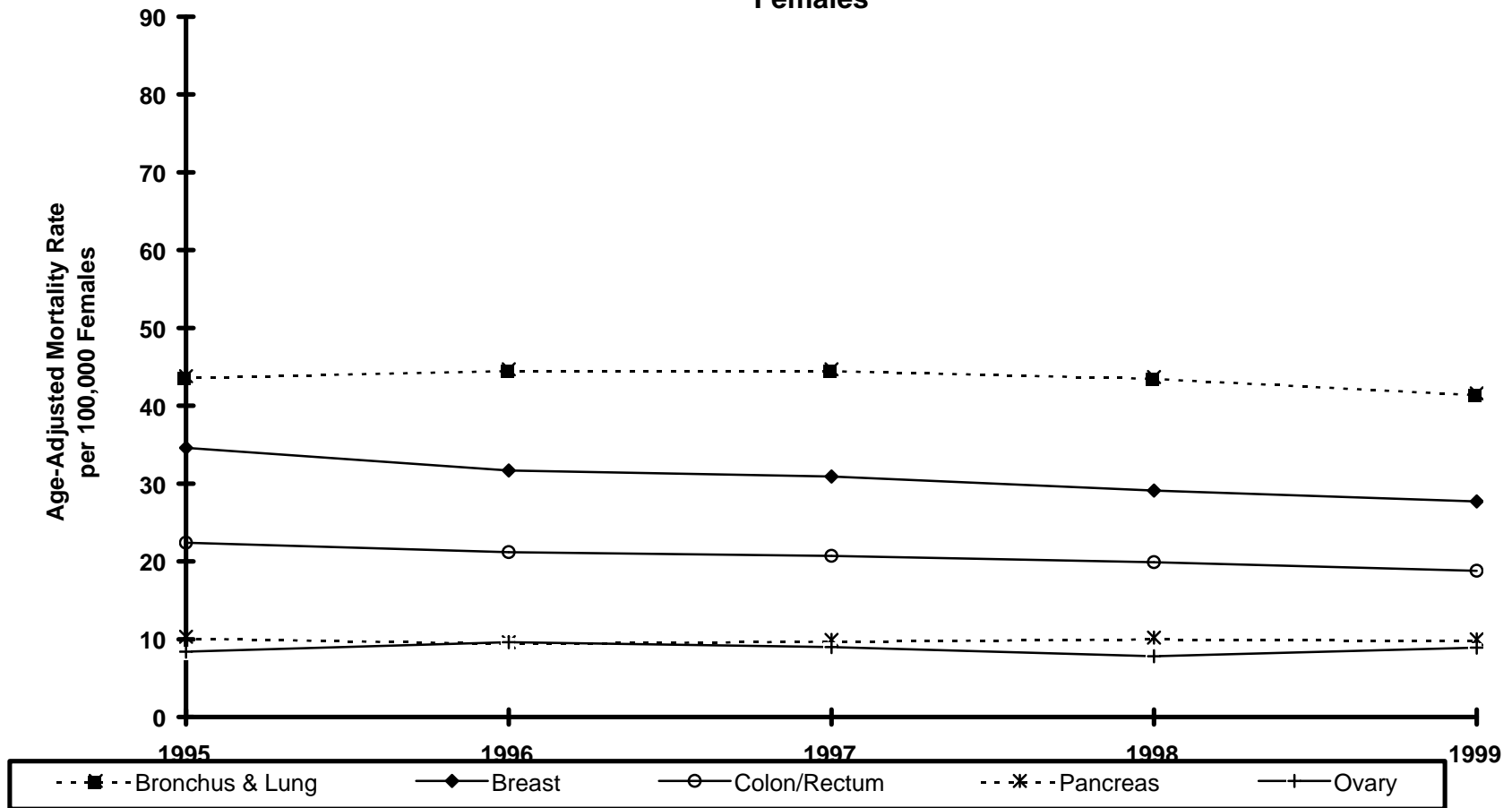




Figure 4B

Massachusetts Cancer Mortality Trends  
for Selected Cancer Types, 1995-1999

Females





# **TABLES**



**Table 3.**  
**CANCER INCIDENCE AND AGE-ADJUSTED<sup>1</sup> INCIDENCE RATES<sup>2</sup> FOR SELECTED CANCER SITES BY SEX**  
**Massachusetts, 1995-1999**

<b><i>Cancer Site / Type</i></b>	<b><i>M a l e s</i></b>			<b><i>F e m a l e s</i></b>			<b><i>T o t a l</i></b>		
	<b><i>Number</i></b>	<b><i>Percent</i></b>	<b><i>Rate</i></b>	<b><i>Number</i></b>	<b><i>Percent</i></b>	<b><i>Rate</i></b>	<b><i>Number<sup>3</sup></i></b>	<b><i>Percent</i></b>	<b><i>Rate</i></b>
<b>All Sites</b>	77922	100.0	590.4	78787	100.0	442.7	156735	100.0	498.1
<b>Brain &amp; Central Nervous System</b>	1175	1.5	8.4	992	1.3	5.9	2167	1.4	7.0
<b>Breast</b>	204	0.3	1.6	24919	31.6	145.3	25126	16.0	81.1
<b>Bronchus &amp; Lung</b>	12185	15.6	93.0	10326	13.1	57.7	22514	14.4	71.6
<b>Cervix Uteri</b>	0	0.0	- - -	1432	1.8	8.6	1432	0.9	- - -
<b>Colon / Rectum</b>	9590	12.3	74.8	9930	12.6	51.5	19525	12.5	60.9
<b>Corpus Uteri &amp; Uterus, NOS</b>	0	0.0	- - -	4776	6.1	28.0	4777	3.0	- - -
<b>Esophagus</b>	1386	1.8	10.5	483	0.6	2.5	1870	1.2	6.0
<b>Hodgkin's Disease</b>	609	0.8	4.0	494	0.6	2.9	1105	0.7	3.4
<b>Kidney &amp; Renal Pelvis<sup>4</sup></b>	2273	2.9	17.1	1509	1.9	8.5	3783	2.4	12.2
<b>Larynx</b>	1286	1.7	9.6	340	0.4	2.0	1626	1.0	5.3
<b>Leukemia</b>	1828	2.3	13.7	1511	1.9	8.4	3341	2.1	10.6
<b>Liver &amp; Intrahepatic Bile Ducts</b>	885	1.1	6.6	397	0.5	2.1	1282	0.8	4.1
<b>Melanoma of Skin</b>	2602	3.3	19.3	2107	2.7	12.2	4710	3.0	15.0
<b>Multiple Myeloma</b>	750	1.0	5.8	697	0.9	3.8	1447	0.9	4.6
<b>Non-Hodgkin's Lymphoma</b>	3142	4.0	23.4	3000	3.8	16.5	6143	3.9	19.4
<b>Oral Cavity &amp; Pharynx</b>	2403	3.1	17.9	1235	1.6	7.0	3638	2.3	11.8
<b>Ovary</b>	0	0.0	- - -	2905	3.7	17.0	2905	1.9	- - -
<b>Pancreas</b>	1621	2.1	12.5	1821	2.3	9.5	3442	2.2	10.8
<b>Prostate</b>	23720	30.4	179.1	0	0.0	- - -	23721	15.1	- - -
<b>Stomach</b>	1632	2.1	12.8	1079	1.4	5.5	2712	1.7	8.5
<b>Testis</b>	949	1.2	5.8	0	0.0	- - -	951	0.6	- - -
<b>Thyroid</b>	530	0.7	3.6	1463	1.9	8.8	1993	1.3	6.3
<b>Urinary Bladder<sup>5</sup></b>	3853	4.9	30.4	1579	2.0	8.2	5433	3.5	17.0
<b>Other Sites</b>	5299	6.8	- - -	5792	7.4	- - -	11092	7.1	- - -

<sup>1</sup> age-adjusted to the 2000 U.S. Standard Population

<sup>2</sup> per 100,000

<sup>3</sup> Totals also include persons classified as transsexuals or hermaphrodites, and persons of unknown sex.

<sup>4</sup> Massachusetts rates for this site include codes 64.9 & 65.9 (ICD-O-2) only for comparability. Massachusetts hospital coding conventions may have assigned some cases to a "not otherwise specified" category. <sup>5</sup> Massachusetts rates include invasive bladder cancer only.



**Table 4.**  
**CANCER INCIDENCE BY SEX AND RACE/ETHNICITY<sup>1</sup>**  
**Massachusetts, 1995-1999**

<b><i>Cancer Site / Type</i></b>	<b><i>White, non-Hispanic</i></b>			<b><i>Black, non-Hispanic</i></b>			<b><i>Asian, non-Hispanic</i></b>			<b><i>Hispanic</i></b>		
	<b><i>Males</i></b>	<b><i>Females</i></b>	<b><i>Total<sup>2</sup></i></b>	<b><i>Males</i></b>	<b><i>Females</i></b>	<b><i>Total<sup>2</sup></i></b>	<b><i>Males</i></b>	<b><i>Females</i></b>	<b><i>Total<sup>2</sup></i></b>	<b><i>Males</i></b>	<b><i>Females</i></b>	<b><i>Total<sup>2</sup></i></b>
<b>All Sites</b>	71227	72658	143907	2621	2046	4668	818	849	1668	1462	1382	2845
<b>Brain &amp; Central Nervous System</b>	1084	912	1996	17	22	39	12	10	22	39	26	65
<b>Breast</b>	183	23047	23233	10	614	624	3	240	243	3	402	405
<b>Bronchus &amp; Lung</b>	11317	9723	21043	384	249	633	135	78	213	186	93	279
<b>Cervix Uteri</b>	0	1144	1144	0	84	84	0	40	40	0	102	102
<b>Colon / Rectum</b>	8937	9269	18210	265	241	506	81	99	181	123	118	241
<b>Corpus Uteri &amp; Uterus, NOS</b>	0	4456	4457	0	102	102	0	41	41	0	87	87
<b>Esophagus</b>	1264	422	1687	62	32	94	13	4	17	27	11	38
<b>Hodgkin's Disease</b>	530	448	978	20	15	36	5	4	9	30	18	48
<b>Kidney &amp; Renal Pelvis<sup>3</sup></b>	2103	1398	3502	67	48	115	23	4	27	43	31	74
<b>Larynx</b>	1177	312	1489	49	16	65	10	1	11	30	6	36
<b>Leukemia</b>	1673	1361	3035	51	42	93	19	29	48	46	42	89
<b>Liver &amp; Intrahepatic Bile Ducts</b>	728	334	1062	39	17	56	60	29	89	43	9	52
<b>Melanoma of Skin</b>	2457	1969	4427	5	8	13	5	4	9	21	10	31
<b>Multiple Myeloma</b>	679	615	1294	35	47	82	3	7	10	19	14	33
<b>Non-Hodgkin's Lymphoma</b>	2822	2733	5556	95	91	186	45	28	73	90	74	164
<b>Oral Cavity &amp; Pharynx</b>	2129	1134	3263	89	36	125	58	27	85	74	21	95
<b>Ovary</b>	0	2681	2681	0	42	42	0	36	36	0	64	64
<b>Pancreas</b>	1480	1699	3179	54	61	115	12	12	24	35	21	56
<b>Prostate</b>	21401	0	21402	1045	0	1045	172	0	172	418	0	418
<b>Stomach</b>	1440	957	2398	88	44	132	43	37	80	36	25	61
<b>Testis</b>	875	0	877	11	0	11	11	0	11	25	0	25
<b>Thyroid</b>	482	1270	1752	5	32	37	13	45	58	10	53	63
<b>Urinary Bladder<sup>4</sup></b>	3679	1492	5172	53	26	79	24	7	31	33	20	53
<b>Other Sites</b>	4787	5282	10070	177	177	354	71	67	138	131	135	266

<sup>1</sup> Race/ethnicity categories are mutually exclusive. Cases are only included in one race/ethnicity category.

<sup>2</sup> Totals also include persons classified as transsexuals or hermaphrodites, and persons of unknown sex.

<sup>3</sup> Massachusetts rates for this site include codes 64.9 & 65.9 (ICD-O-2) only for comparability. Massachusetts hospital coding conventions may have assigned some cases to a "not otherwise specified" category.

<sup>4</sup> Massachusetts rates include invasive bladder cancer only.





**Table 5.**  
**AGE-ADJUSTED<sup>1</sup> INCIDENCE RATES<sup>2</sup> FOR SELECTED CANCER SITES BY SEX AND RACE/ETHNICITY<sup>3</sup>**  
**Massachusetts, 1995-1999**

<b><i>Cancer Site / Type</i></b>	<b><i>White, non-Hispanic</i></b>			<b><i>Black, non-Hispanic</i></b>			<b><i>Asian, non-Hispanic</i></b>			<b><i>Hispanic</i></b>		
	<b><i>Males</i></b>	<b><i>Females</i></b>	<b><i>Total</i></b>	<b><i>Males</i></b>	<b><i>Females</i></b>	<b><i>Total</i></b>	<b><i>Males</i></b>	<b><i>Females</i></b>	<b><i>Total</i></b>	<b><i>Males</i></b>	<b><i>Females</i></b>	<b><i>Total</i></b>
<b>All Sites</b>	580.0	439.7	491.6	706.9	386.6	515.4	401.3	322.5	354.8	413.1	277.2	331.9
<b>Brain &amp; Central Nervous System</b>	8.5	5.9	7.1	*	3.6	3.5	*	*	3.5	6.2	3.4	4.7
<b>Breast</b>	1.5	145.4	81.1	*	113.7	65.1	*	81.6	43.5	*	82.3	45.5
<b>Bronchus &amp; Lung</b>	92.4	58.1	71.5	109.6	48.9	73.2	73.1	35.6	52.4	58.0	21.9	37.3
<b>Cervix Uteri</b>	---	7.6	---	---	14.9	---	---	12.9	---	---	17.7	---
<b>Colon / Rectum</b>	74.5	50.9	60.4	76.9	47.8	59.2	43.0	46.4	45.3	40.8	27.4	32.6
<b>Corpus Uteri &amp; Uterus, NOS</b>	---	28.2	---	---	20.4	---	---	15.2	---	---	17.9	---
<b>Esophagus</b>	10.3	2.3	5.7	17.0	6.4	10.8	*	*	*	9.1	*	5.6
<b>Hodgkin's Disease</b>	3.9	3.0	3.4	2.9	*	2.5	*	*	*	4.3	*	3.2
<b>Kidney &amp; Renal Pelvis<sup>4</sup></b>	17.0	8.5	12.1	17.1	8.9	12.3	10.2	*	5.3	11.0	6.4	8.5
<b>Larynx</b>	9.5	1.9	5.2	12.9	*	7.2	*	*	*	8.9	*	4.7
<b>Leukemia</b>	13.7	8.3	10.5	10.5	7.2	8.6	*	8.9	8.1	7.7	6.1	6.9
<b>Liver &amp; Intrahepatic Bile Ducts</b>	5.9	1.9	3.6	9.5	*	6.0	24.0	13.2	18.8	11.9	*	6.6
<b>Melanoma of Skin</b>	19.7	12.5	15.4	*	*	*	*	*	*	5.7	*	3.4
<b>Multiple Myeloma</b>	5.6	3.5	4.4	9.3	9.6	9.6	*	*	*	*	*	4.4
<b>Non-Hodgkin's Lymphoma</b>	22.9	16.1	19.0	19.7	16.6	18.3	21.3	10.1	15.1	18.6	14.5	16.2
<b>Oral Cavity &amp; Pharynx</b>	17.2	6.9	11.4	23.4	6.6	13.6	19.0	9.9	14.5	19.6	4.6	11.4
<b>Ovary</b>	---	17.1	---	---	7.8	---	---	12.7	---	---	11.9	---
<b>Pancreas</b>	12.3	9.4	10.6	14.1	12.4	13.4	*	*	5.8	10.4	5.4	7.5
<b>Prostate</b>	172.6	---	---	293.6	---	---	95.3	---	---	141.7	---	---
<b>Stomach</b>	12.1	5.2	8.0	24.1	9.0	15.3	22.4	14.4	17.9	10.1	5.3	7.4
<b>Testis</b>	6.2	---	---	*	---	---	*	---	---	2.8	---	---
<b>Thyroid</b>	3.7	8.6	6.2	*	4.8	3.0	*	13.0	8.8	*	7.3	4.4
<b>Urinary Bladder<sup>5</sup></b>	31.0	8.3	17.2	15.7	5.3	9.7	13.5	*	8.1	11.1	4.3	7.1

<sup>1</sup> age-adjusted to the 2000 U.S. Standard Population

<sup>2</sup> per 100,000    <sup>3</sup> Race/ethnicity categories are mutually exclusive. Cases are only included in one race/ethnicity category.

<sup>4</sup> Massachusetts rates for this site include codes 64.9 & 65.9 (ICD-O-2) only for comparability. Massachusetts hospital coding conventions may have assigned some cases to a "not otherwise specified" category.    <sup>5</sup> Massachusetts rates include invasive bladder cancer only.

\* age-adjusted incidence rate not calculated when number of cases < 20



**Table 6.**  
**CANCER MORTALITY AND AGE-ADJUSTED<sup>1</sup> MORTALITY RATES<sup>2</sup> FOR SELECTED CANCER SITES BY SEX**  
**Massachusetts, 1995-1999<sup>3</sup>**

<b><u>Cancer Site / Type</u></b>	<b><i>M a l e s</i></b>			<b><i>F e m a l e s</i></b>			<b><i>T o t a l</i></b>		
	<b><u>Number</u></b>	<b><u>Percent</u></b>	<b><u>Rate</u></b>	<b><u>Number</u></b>	<b><u>Percent</u></b>	<b><u>Rate</u></b>	<b><u>Number</u></b>	<b><u>Percent</u></b>	<b><u>Rate</u></b>
<b>All Sites</b>	34822	100.0	275.4	34843	100.0	182.6	69665	100.0	217.0
<b>Brain &amp; Central Nervous System</b>	778	2.2	5.7	633	1.8	3.6	1411	2.0	4.5
<b>Breast</b>	39	0.1	0.3	5678	16.3	30.8	5717	8.2	18.0
<b>Bronchus &amp; Lung</b>	10018	28.8	77.6	8038	23.1	43.7	18056	25.9	56.9
<b>Cervix Uteri</b>	0	0.0	---	404	1.2	2.4	404	0.6	---
<b>Colon / Rectum</b>	3774	10.8	30.4	4204	12.1	20.6	7978	11.5	24.4
<b>Corpus Uteri &amp; Uterus, NOS</b>	0	0.0	---	823	2.4	4.3	823	1.2	---
<b>Esophagus</b>	1233	3.5	9.5	418	1.2	2.1	1651	2.4	5.2
<b>Hodgkin's Disease</b>	100	0.3	0.7	88	0.3	0.5	188	0.3	0.6
<b>Kidney &amp; Renal Pelvis</b>	802	2.3	6.3	534	1.5	2.8	1336	1.9	4.2
<b>Larynx</b>	390	1.1	3.0	98	0.3	0.5	488	0.7	1.6
<b>Leukemia</b>	1306	3.8	10.3	1134	3.3	5.8	2440	3.5	7.5
<b>Liver &amp; Intrahepatic Bile Ducts</b>	695	2.0	5.2	320	0.9	1.7	1015	1.5	3.2
<b>Melanoma of Skin</b>	552	1.6	4.2	400	1.1	2.2	952	1.4	3.0
<b>Multiple Myeloma</b>	608	1.7	4.9	615	1.8	3.2	1223	1.8	3.8
<b>Non-Hodgkin's Lymphoma</b>	1483	4.3	11.6	1439	4.1	7.3	2922	4.2	9.1
<b>Oral Cavity &amp; Pharynx</b>	595	1.7	4.6	328	0.9	1.7	923	1.3	2.9
<b>Ovary</b>	0	0.0	---	1611	4.6	8.8	1611	2.3	---
<b>Pancreas</b>	1640	4.7	12.8	1968	5.6	10.0	3608	5.2	11.2
<b>Prostate</b>	3989	11.5	34.3	0	0.0	---	3989	5.7	---
<b>Stomach</b>	1060	3.0	8.5	785	2.3	3.9	1845	2.6	5.7
<b>Testis</b>	54	0.2	0.4	0	0.0	---	54	0.1	---
<b>Thyroid</b>	61	0.2	0.5	87	0.2	0.4	148	0.2	0.5
<b>Urinary Bladder</b>	1122	3.2	9.5	568	1.6	2.7	1690	2.4	5.1
<b>Other Sites</b>	4523	13.0	---	4670	13.4	---	9193	13.2	---

<sup>1</sup> age-adjusted to the 2000 U.S. Standard Population

<sup>2</sup> per 100,000

<sup>3</sup> Data for 1995-1998 have been modified using the comparability ratios.



**Table 7.**  
**CANCER MORTALITY BY SEX AND RACE/ETHNICITY<sup>1</sup>**  
**Massachusetts, 1995-1999<sup>2</sup>**

<b><u>Cancer Site / Type</u></b>	<b><u>White, non-Hispanic</u></b>			<b><u>Black, non-Hispanic</u></b>			<b><u>Asian, non-Hispanic</u></b>			<b><u>Hispanic</u></b>		
	<b><u>Males</u></b>	<b><u>Females</u></b>	<b><u>Total</u></b>	<b><u>Males</u></b>	<b><u>Females</u></b>	<b><u>Total</u></b>	<b><u>Males</u></b>	<b><u>Females</u></b>	<b><u>Total</u></b>	<b><u>Males</u></b>	<b><u>Females</u></b>	<b><u>Total</u></b>
<b>All Sites</b>	32679	32965	65644	1306	1182	2488	354	317	671	455	341	796
<b>Brain &amp; Central Nervous System</b>	746	611	1357	9	14	23	5	2	7	18	7	25
<b>Breast</b>	37	5368	5405	2	200	202	0	43	43	0	59	59
<b>Bronchus &amp; Lung</b>	9489	7710	17199	339	228	567	92	52	144	91	39	130
<b>Cervix Uteri</b>	0	346	346	0	35	35	0	10	10	0	13	13
<b>Colon / Rectum</b>	3560	3976	7536	140	141	281	29	35	64	41	46	87
<b>Corpus Uteri &amp; Uterus, NOS</b>	0	777	777	0	32	32	0	3	3	0	9	9
<b>Esophagus</b>	1138	387	1525	67	19	86	6	4	10	21	6	27
<b>Hodgkin's Disease</b>	92	84	176	4	1	5	1	0	1	3	3	6
<b>Kidney &amp; Renal Pelvis</b>	775	515	1290	19	14	33	3	2	5	5	3	8
<b>Larynx</b>	361	90	451	20	7	27	2	1	3	7	0	7
<b>Leukemia</b>	1237	1079	2316	31	27	58	11	16	27	26	11	37
<b>Liver &amp; Intrahepatic Bile Ducts</b>	590	279	869	40	11	51	45	20	65	20	10	30
<b>Melanoma of Skin</b>	545	395	940	2	1	3	1	1	2	4	3	7
<b>Multiple Myeloma</b>	541	554	1095	48	44	92	0	3	3	17	13	30
<b>Non-Hodgkin's Lymphoma</b>	1415	1365	2780	25	37	62	18	10	28	23	25	48
<b>Oral Cavity &amp; Pharynx</b>	538	304	842	28	14	42	13	5	18	14	4	18
<b>Ovary</b>	0	1543	1543	0	42	42	0	12	12	0	13	13
<b>Pancreas</b>	1542	1874	3416	70	75	145	13	7	20	15	11	26
<b>Prostate</b>	3723	0	3723	193	0	193	22	0	22	47	0	47
<b>Stomach</b>	951	701	1652	62	47	109	26	25	51	20	12	32
<b>Testis</b>	53	0	53	0	0	0	0	0	0	1	0	1
<b>Thyroid</b>	58	83	141	2	2	4	1	2	3	0	0	0
<b>Urinary Bladder</b>	1093	537	1630	19	24	43	5	2	7	4	5	9
<b>Other Sites</b>	4195	4387	8582	186	167	353	61	62	123	78	49	127

<sup>1</sup> Race/ethnicity categories are mutually exclusive. Deaths are only included in one race/ethnicity category.

<sup>2</sup> Data for 1995-1998 have been modified using the comparability ratios.



**Table 8.**  
**AGE-ADJUSTED<sup>1</sup> MORTALITY RATES<sup>2</sup> FOR SELECTED CANCER SITES BY SEX AND RACE/ETHNICITY<sup>3</sup>**  
**Massachusetts, 1995-1999<sup>4</sup>**

<b><i>Cancer Site / Type</i></b>	<b><i>White, non-Hispanic</i></b>			<b><i>Black, non-Hispanic</i></b>			<b><i>Asian, non-Hispanic</i></b>			<b><i>Hispanic</i></b>		
	<b><i>Males</i></b>	<b><i>Females</i></b>	<b><i>Total</i></b>	<b><i>Males</i></b>	<b><i>Females</i></b>	<b><i>Total</i></b>	<b><i>Males</i></b>	<b><i>Females</i></b>	<b><i>Total</i></b>	<b><i>Males</i></b>	<b><i>Females</i></b>	<b><i>Total</i></b>
<b>All Sites</b>	276.4	183.9	217.8	388.1	233.6	293.7	186.3	140.8	160.4	136.3	75.8	100.9
<b>Brain &amp; Central Nervous System</b>	5.9	3.7	4.7	*	*	2.2	*	*	*	*	*	1.7
<b>Breast</b>	0.3	31.1	18.2	*	38.2	22.5	*	16.8	8.9	*	12.6	7.0
<b>Bronchus &amp; Lung</b>	78.5	44.8	57.8	98.8	45.6	66.8	50.2	25.5	36.6	29.1	9.2	17.6
<b>Cervix Uteri</b>	---	2.2	---	---	6.6	---	---	*	---	---	*	---
<b>Colon / Rectum</b>	30.5	20.6	24.5	43.3	28.3	34.4	13.3	16.7	15.6	13.6	10.9	11.9
<b>Corpus Uteri &amp; Uterus, NOS</b>	---	4.3	---	---	6.4	---	---	*	---	---	*	---
<b>Esophagus</b>	9.3	2.1	5.2	18.5	*	10.0	*	*	*	7.7	*	4.0
<b>Hodgkin's Disease</b>	0.7	0.5	0.6	*	*	*	*	*	*	*	*	*
<b>Kidney &amp; Renal Pelvis</b>	6.5	2.9	4.3	*	*	3.8	*	*	*	*	*	*
<b>Larynx</b>	3.0	0.5	1.5	5.1	*	3.0	*	*	*	*	*	*
<b>Leukemia</b>	10.5	5.8	7.6	8.2	5.3	6.5	*	*	6.5	5.2	*	3.2
<b>Liver &amp; Intrahepatic Bile Ducts</b>	4.8	1.5	2.9	10.4	*	5.6	18.9	8.9	13.7	5.9	*	4.0
<b>Melanoma of Skin</b>	4.5	2.3	3.2	*	*	*	*	*	*	*	*	*
<b>Multiple Myeloma</b>	4.6	3.0	3.6	14.4	9.1	11.2	*	*	*	*	*	4.4
<b>Non-Hodgkin's Lymphoma</b>	11.9	7.4	9.2	6.4	7.2	7.0	*	*	6.4	5.9	5.2	5.6
<b>Oral Cavity &amp; Pharynx</b>	4.4	1.7	2.9	7.0	*	4.7	*	*	*	*	*	*
<b>Ovary</b>	---	9.0	---	---	8.5	---	---	*	---	---	*	---
<b>Pancreas</b>	12.9	10.1	11.3	19.1	15.3	17.1	*	*	5.1	*	*	3.5
<b>Prostate</b>	33.9	---	---	69.6	---	---	18.4	---	---	20.2	---	---
<b>Stomach</b>	8.2	3.6	5.4	18.0	9.7	13.3	15.6	10.3	12.6	5.4	*	3.9
<b>Testis</b>	0.4	---	---	*	---	---	*	---	---	*	---	---
<b>Thyroid</b>	0.5	0.4	0.5	*	*	*	*	*	*	*	*	*
<b>Urinary Bladder</b>	9.8	2.7	5.2	*	4.9	5.4	*	*	*	*	*	*

<sup>1</sup> age-adjusted to the 2000 U.S. Standard Population

<sup>2</sup> per 100,000

<sup>3</sup> Race/ethnicity categories are mutually exclusive. Deaths are only included in one race/ethnicity category.

<sup>4</sup> Data for 1995-1998 have been modified using the comparability ratios.

\* age-adjusted mortality rate not calculated when number of deaths < 20





# **APPENDICES**



# **APPENDIX I** **ICD CODES USED FOR THIS REPORT**

<i>Cancer Site / Type</i>	<i>..... C o d e s .....</i>		
	<b>ICD-O-2*</b>	<b>ICD-9**</b>	<b>ICD-10***</b>
<b>Brain &amp; Central Nervous System</b>	C70.0 - C72.9 See <b>List I</b> (following) for histology codes.	191, 192	C70 - C72
<b>Breast</b>	C50.0 - C50.9 except 9590 – 9989	174, 175	C50
<b>Bronchus &amp; Lung</b>	C34.0 - C34.9 except 9050 - 9053, 9590 – 9989	162	C33 - C34
<b>Cervix Uteri</b>	C53.0 - C53.9 except 9590 – 9989	180	C53
<b>Colon/Rectum</b>	C18.0 - C18.9, C19.9, C20.9, C26.0 except 9590 – 9989	153, 154, 159.0	C18 - C21
<b>Corpus Uteri &amp; Uterus, NOS</b>	C54.0 - C54.9, C55.9 except 9590 – 9989	179, 182	C54 - C55
<b>Esophagus</b>	C15.0 - C15.9 except 9590 – 9989	150	C15
<b>Hodgkin's Disease</b>	C00.0 - C80.9 (includes O9650 - O9667)	201	C81
<b>Kidney &amp; Renal Pelvis</b>	C64.9, C65.9 except 9590 – 9989	189.0 - 189.1	C64 - C65
<b>Larynx</b>	C32.0 - C32.9 except 9590 – 9989	161	C32

\* *International Classification of Diseases for Oncology, 2nd Ed.* (1990) for incidence data

\*\* *International Classification of Diseases, Ninth Revision, Clinical Modification* (1980) for 1995-1998 mortality data

\*\*\* *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision* (1992) for 1999 mortality data

<i>Cancer Site / Type</i>	<i>Codes</i>		
	<b>ICD-O-2*</b>	<b>ICD-9**</b>	<b>ICD-10***</b>
<b>Leukemia</b>	C00.0 - C80.9 (includes O9800 - O9941)	202.4, 204 - 208	C91 - C95
<b>Liver and Intra-hepatic Bile Ducts</b>	C22.0, C22.1 except 9590 – 9989	155.0, 155.1	C22
<b>Melanoma of Skin</b>	C44.0 - C44.9 (includes O8720 - O8790)	172	C43
<b>Multiple Myeloma</b>	C00.0 - C80.9 (includes O9731, O9732)	203	C88, C90
<b>Non-Hodgkin's Lymphoma</b>	C00.0 - C80.9 See <b>List II</b> (following) for histology codes.	200, 202 (except 202.4)	C82 - C85
<b>Oral Cavity &amp; Pharynx</b>	C00.0 - C14.8 except 9590 – 9989	140 - 149	C00 - C14
<b>Ovary</b>	C56.9 except 9590 – 9989	183.0	C56
<b>Pancreas</b>	C25.0 - C25.9 except 9590 – 9989	157	C25
<b>Prostate</b>	C61.9 except 9590 – 9989	185	C61
<b>Stomach</b>	C16.0 - C16.9 except 9590 – 9989	151	C16

\* *International Classification of Diseases for Oncology, 2nd Ed.* (1990) for incidence data

\*\* *International Classification of Diseases, Ninth Revision, Clinical Modification* (1980) for 1995-1998 mortality data

\*\*\* *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision* (1992) for 1999 mortality data

<i>Cancer Site / Type</i>	<i>. . . . . C o d e s . . . . .</i>		
	<b>ICD-O-2*</b>	<b>ICD-9**</b>	<b>ICD-10***</b>
<b>Testis</b>	C62.0 - C62.9 except 9590 – 9989	186	C62.9
<b>Thyroid</b>	C73.9 except 9590 – 9989	193	C73
<b>Urinary Bladder</b>	C67.0 - C67.9 except 9590 – 9989	188	C67

\* *International Classification of Diseases for Oncology, 2nd Ed. (1990) for incidence data*

\*\* *International Classification of Diseases, Ninth Revision, Clinical Modification (1980) for 1995-1998 mortality data*

\*\*\* *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (1992) for 1999 mortality data*

#### **List I -- Histology Codes for Brain and Central Nervous System Neoplasms**

ICD-O      O9370, O9380, O9381, O9382, O9390, O9391, O9392, O9400, O9401, O9410, O9411, O9420, O9421, O9422, O9423, O9424, O9430, O9440, O9441, O9442, O9443, O9450, O9451, O9460, O9470, O9471, O9472, O9473, O9480, O9481, O9490, O9500, O9501, O9502, O9503, O9530, O9539, O9540, O9560, O9561

#### **List II -- Histology Codes for Non-Hodgkin's Lymphomas**

ICD-O      O9590 - O9595, O9670 - O9717



**APPENDIX II**  
**ANNUAL AGE-ADJUSTED<sup>1</sup> CANCER INCIDENCE RATES<sup>2</sup>**  
**by Primary Cancer Site, 1995-1999**  
**Massachusetts, MALES**

<b>Site or Type</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
<b>All Sites</b>	577.6	592.4	601.8	596.5	583.0
<b>Brain &amp; Central Nervous System</b>	8.1	8.1	9.4	8.8	7.4
<b>Breast</b>	1.3	2.0	1.4	1.5	1.7
<b>Bronchus &amp; Lung</b>	91.0	91.0	95.1	97.2	90.5
<b>Colon / Rectum</b>	72.9	77.4	75.4	76.5	71.9
<b>Esophagus</b>	11.3	10.1	10.0	10.2	11.1
<b>Hodgkin's Disease</b>	4.1	4.6	3.2	4.2	3.8
<b>Kidney &amp; Renal Pelvis<sup>3</sup></b>	17.3	16.1	17.2	16.9	17.9
<b>Larynx</b>	10.5	10.0	10.1	8.8	8.8
<b>Leukemia</b>	12.6	13.8	14.5	13.8	13.8
<b>Liver &amp; Intrahepatic Bile Ducts</b>	5.1	5.8	7.4	7.9	6.9
<b>Melanoma of Skin</b>	17.2	19.5	19.3	19.9	20.2
<b>Multiple Myeloma</b>	6.4	6.2	5.5	5.5	5.5
<b>Non-Hodgkin's Lymphoma</b>	23.8	24.7	23.4	22.4	22.9
<b>Oral Cavity &amp; Pharynx</b>	18.5	19.1	17.3	18.2	16.6
<b>Pancreas</b>	10.1	10.4	14.3	13.9	13.8
<b>Prostate</b>	173.7	178.6	182.2	177.1	183.6
<b>Stomach</b>	13.1	12.2	13.7	12.6	12.3
<b>Testis</b>	6.1	5.4	4.9	6.4	6.3
<b>Thyroid</b>	3.2	4.1	3.2	3.8	3.9
<b>Urinary Bladder<sup>4</sup></b>	30.9	32.5	33.0	30.4	25.5

<sup>1</sup> age-adjusted to the 2000 U.S. Standard Population

<sup>2</sup> per 100,000 males

<sup>3</sup> Massachusetts rates for this site include codes 64.9 & 65.9 (ICD-O-2) only for comparability. Massachusetts hospital coding conventions may have assigned some cases to a "not otherwise specified" category. <sup>4</sup> Massachusetts rates include invasive bladder cancer only.

**ANNUAL AGE-ADJUSTED<sup>1</sup> CANCER INCIDENCE RATES<sup>2</sup>**  
**by Primary Cancer Site, 1995-1999**  
**Massachusetts, FEMALES**

<b>Site or Type</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
<b>All Sites</b>	432.8	431.1	447.4	453.9	447.4
<b>Brain &amp; Central Nervous System</b>	5.5	5.5	6.5	5.6	6.1
<b>Breast</b>	143.6	140.8	142.9	152.6	146.1
<b>Bronchus &amp; Lung</b>	54.8	55.9	59.4	59.1	59.0
<b>Cervix Uteri</b>	9.0	9.6	9.7	7.9	6.9
<b>Colon / Rectum</b>	50.5	52.1	53.2	50.6	51.1
<b>Corpus Uteri &amp; Uterus, NOS</b>	27.9	27.1	26.8	28.9	29.1
<b>Esophagus</b>	2.6	2.4	2.6	2.8	2.2
<b>Hodgkin's Disease</b>	2.5	2.7	2.9	3.3	3.1
<b>Kidney &amp; Renal Pelvis<sup>3</sup></b>	8.9	7.3	7.1	9.5	9.6
<b>Larynx</b>	2.2	2.3	1.8	1.8	1.8
<b>Leukemia</b>	8.1	8.5	7.7	8.6	9.3
<b>Liver &amp; Intrahepatic Bile Ducts</b>	1.9	1.6	2.1	2.4	2.6
<b>Melanoma of Skin</b>	10.5	11.7	12.9	12.0	13.8
<b>Multiple Myeloma</b>	3.8	3.8	4.1	4.0	3.3
<b>Non-Hodgkin's Lymphoma</b>	16.3	16.5	17.1	15.9	16.8
<b>Oral Cavity &amp; Pharynx</b>	6.5	7.1	7.2	6.6	7.4
<b>Ovary</b>	18.4	17.1	16.5	16.9	16.2
<b>Pancreas</b>	8.7	8.5	10.2	10.3	9.8
<b>Stomach</b>	5.6	5.3	6.2	5.8	4.7
<b>Thyroid</b>	7.5	7.5	8.5	10.1	10.5
<b>Urinary Bladder<sup>4</sup></b>	8.3	8.8	8.4	8.6	6.9

<sup>1</sup> age-adjusted to the 2000 U.S. Standard Population

<sup>2</sup> per 100,000 females

<sup>3</sup> Massachusetts rates for this site include codes 64.9 & 65.9 (ICD-O-2) only for comparability. Massachusetts hospital coding conventions may have assigned some cases to a "not otherwise specified" category. <sup>4</sup> Massachusetts rates include invasive bladder cancer only.



**ANNUAL AGE-ADJUSTED<sup>1</sup> CANCER INCIDENCE RATES<sup>2</sup>**  
**by Primary Cancer Site, 1995-1999**  
**Massachusetts, TOTAL**

<b>Site or Type</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
<b>All Sites</b>	486.8	491.4	505.5	507.6	498.3
<b>Brain &amp; Central Nervous System</b>	6.7	6.7	7.7	7.1	6.7
<b>Breast</b>	80.4	78.8	79.9	84.8	81.4
<b>Bronchus &amp; Lung</b>	69.2	69.5	73.5	73.9	71.6
<b>Cervix Uteri</b>	9.0	9.6	9.7	7.9	6.9
<b>Colon / Rectum</b>	59.4	62.1	62.1	61.3	59.5
<b>Corpus Uteri &amp; Uterus, NOS</b>	27.9	27.1	26.8	28.9	29.1
<b>Esophagus</b>	6.4	5.7	5.7	6.0	6.0
<b>Hodgkin's Disease</b>	3.2	3.6	3.1	3.7	3.4
<b>Kidney &amp; Renal Pelvis<sup>3</sup></b>	12.6	11.1	11.4	12.6	13.2
<b>Larynx</b>	5.8	5.7	5.4	4.8	4.8
<b>Leukemia</b>	10.0	10.7	10.4	10.7	11.1
<b>Liver &amp; Intrahepatic Bile Ducts</b>	3.3	3.5	4.4	4.8	4.5
<b>Melanoma of Skin</b>	13.1	14.7	15.5	15.2	16.3
<b>Multiple Myeloma</b>	4.8	4.7	4.7	4.5	4.3
<b>Non-Hodgkin's Lymphoma</b>	19.5	20.0	19.8	18.6	19.4
<b>Oral Cavity &amp; Pharynx</b>	11.8	12.4	11.6	11.8	11.4
<b>Ovary</b>	18.4	17.1	16.5	16.9	16.2
<b>Pancreas</b>	9.4	9.3	11.9	11.8	11.4
<b>Prostate</b>	173.7	178.6	182.2	177.1	183.6
<b>Stomach</b>	8.6	8.1	9.3	8.5	7.8
<b>Testis</b>	6.1	5.4	4.9	6.4	6.3
<b>Thyroid</b>	5.5	5.8	5.9	7.1	7.3
<b>Urinary Bladder<sup>4</sup></b>	17.2	18.2	18.2	17.2	14.3

<sup>1</sup> age-adjusted to the 2000 U.S. Standard Population

<sup>2</sup> per 100,000 residents, except for single-sex sites -- per 100,000 females for Cervix Uteri; Corpus Uteri & Uterus, NOS; and Ovary; per 100,000 males for Prostate

<sup>3</sup> Massachusetts rates for this site include codes 64.9 & 65.9 (ICD-O-2) only for comparability. Massachusetts hospital coding conventions may have assigned some cases to a "not otherwise specified" category. <sup>4</sup> Massachusetts rates include invasive bladder cancer only.



**APPENDIX III**  
**ANNUAL AGE-ADJUSTED<sup>1</sup> CANCER MORTALITY RATES<sup>2</sup>**  
**by Primary Cancer Site, 1995-1999<sup>3</sup>**  
**Massachusetts, MALES**

<b>Site or Type</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
<b>All Sites</b>	287.7	285.3	271.0	266.0	268.4
<b>Brain &amp; Central Nervous System</b>	5.3	6.3	5.1	5.8	5.9
<b>Breast</b>	0.4	0.4	0.4	0.2	0.2
<b>Bronchus &amp; Lung</b>	81.8	80.1	76.2	75.1	75.2
<b>Colon / Rectum</b>	33.2	30.8	29.2	30.7	28.1
<b>Esophagus</b>	9.7	9.0	8.9	9.5	10.1
<b>Hodgkin's Disease</b>	0.7	1.0	0.3	0.7	1.0
<b>Kidney &amp; Renal Pelvis</b>	6.7	6.4	6.6	6.1	5.6
<b>Larynx</b>	2.9	3.3	2.8	3.0	3.1
<b>Leukemia</b>	10.8	10.9	9.7	9.6	10.4
<b>Liver &amp; Intrahepatic Bile Ducts</b>	4.8	4.7	5.1	4.8	6.7
<b>Melanoma of Skin</b>	3.2	4.5	4.6	4.6	4.1
<b>Multiple Myeloma</b>	5.4	4.9	5.1	4.1	4.8
<b>Non-Hodgkin's Lymphoma</b>	11.6	12.9	10.9	11.6	10.9
<b>Oral Cavity &amp; Pharynx</b>	5.5	4.1	4.3	4.2	4.7
<b>Pancreas</b>	12.8	12.9	12.8	12.7	12.9
<b>Prostate</b>	35.1	36.3	34.3	32.0	33.6
<b>Stomach</b>	9.5	9.4	8.3	8.1	7.3
<b>Testis</b>	0.3	0.5	0.4	0.2	0.4
<b>Thyroid</b>	0.5	0.4	0.7	0.3	0.5
<b>Urinary Bladder</b>	9.1	10.2	9.7	8.6	9.7

<sup>1</sup> age-adjusted to the 2000 U.S. Standard Population

<sup>2</sup> per 100,000 males

<sup>3</sup> Data for 1995-1998 have been modified using the comparability ratios.

**ANNUAL AGE-ADJUSTED<sup>1</sup> CANCER MORTALITY RATES<sup>2</sup>**  
**by Primary Cancer Site, 1995-1999<sup>3</sup>**  
**Massachusetts, FEMALES**

<b>Site or Type</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
<b>All Sites</b>	190.9	186.1	185.1	177.3	174.0
<b>Brain &amp; Central Nervous System</b>	3.8	3.1	3.5	3.7	3.8
<b>Breast</b>	34.6	31.7	30.9	29.1	27.7
<b>Bronchus &amp; Lung</b>	43.8	44.7	44.7	43.7	41.6
<b>Cervix Uteri</b>	2.5	2.6	2.3	2.6	1.8
<b>Colon / Rectum</b>	22.4	21.2	20.7	19.9	18.8
<b>Corpus Uteri &amp; Uterus, NOS</b>	4.5	4.6	4.1	4.0	4.1
<b>Esophagus</b>	2.0	2.3	2.0	2.5	1.9
<b>Hodgkin's Disease</b>	0.4	0.4	0.6	0.4	0.7
<b>Kidney &amp; Renal Pelvis</b>	2.9	3.0	2.5	2.5	3.1
<b>Larynx</b>	0.6	0.5	0.7	0.5	0.5
<b>Leukemia</b>	6.1	5.8	5.6	5.2	6.2
<b>Liver &amp; Intrahepatic Bile Ducts</b>	1.6	1.3	1.7	1.4	2.4
<b>Melanoma of Skin</b>	2.4	2.4	2.3	1.9	1.8
<b>Multiple Myeloma</b>	3.3	3.2	2.9	3.3	3.2
<b>Non-Hodgkin's Lymphoma</b>	7.3	7.0	8.0	7.0	7.4
<b>Oral Cavity &amp; Pharynx</b>	2.0	1.6	1.5	1.8	1.7
<b>Ovary</b>	8.4	9.6	9.0	7.8	8.9
<b>Pancreas</b>	10.3	9.6	9.9	10.2	10.0
<b>Stomach</b>	4.0	4.0	3.9	3.9	3.5
<b>Thyroid</b>	0.4	0.4	0.5	0.5	0.5
<b>Urinary Bladder</b>	2.8	2.6	3.0	2.3	2.6

<sup>1</sup> age-adjusted to the 2000 U.S. Standard Population

<sup>2</sup> per 100,000 females

<sup>3</sup> Data for 1995-1998 have been modified using the comparability ratios.

**ANNUAL AGE-ADJUSTED<sup>1</sup> CANCER MORTALITY RATES<sup>2</sup>**  
**by Primary Cancer Site, 1995-1999<sup>3</sup>**  
**Massachusetts, TOTAL**

<b>Site or Type</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
<b>All Sites</b>	226.9	222.7	216.6	210.2	209.2
<b>Brain &amp; Central Nervous System</b>	4.4	4.5	4.2	4.7	4.8
<b>Breast</b>	20.3	18.6	18.1	16.9	16.1
<b>Bronchus &amp; Lung</b>	58.7	58.3	56.8	56.0	54.9
<b>Cervix Uteri</b>	2.5	2.6	2.3	2.6	1.8
<b>Colon / Rectum</b>	26.6	24.9	24.2	24.0	22.6
<b>Corpus Uteri &amp; Uterus, NOS</b>	4.5	4.6	4.1	4.0	4.1
<b>Esophagus</b>	5.3	5.1	4.9	5.5	5.4
<b>Hodgkin's Disease</b>	0.5	0.7	0.4	0.5	0.8
<b>Kidney &amp; Renal Pelvis</b>	4.4	4.4	4.2	4.0	4.1
<b>Larynx</b>	1.5	1.6	1.6	1.6	1.6
<b>Leukemia</b>	7.9	7.8	7.2	6.9	7.9
<b>Liver &amp; Intrahepatic Bile Ducts</b>	3.0	2.8	3.1	2.9	4.3
<b>Melanoma of Skin</b>	2.8	3.3	3.2	3.0	2.8
<b>Multiple Myeloma</b>	4.0	3.9	3.8	3.6	3.8
<b>Non-Hodgkin's Lymphoma</b>	9.1	9.3	9.2	8.8	8.9
<b>Oral Cavity &amp; Pharynx</b>	3.5	2.7	2.7	2.9	3.0
<b>Ovary</b>	8.4	9.6	9.0	7.8	8.9
<b>Pancreas</b>	11.4	10.9	11.2	11.3	11.3
<b>Prostate</b>	35.1	36.3	34.3	32.0	33.6
<b>Stomach</b>	6.2	6.1	5.6	5.6	5.0
<b>Testis</b>	0.3	0.5	0.4	0.2	0.4
<b>Thyroid</b>	0.4	0.4	0.5	0.4	0.5
<b>Urinary Bladder</b>	5.0	5.4	5.4	4.6	5.1

<sup>1</sup> age-adjusted to the 2000 U.S. Standard Population

<sup>2</sup> per 100,000 residents, except for single-sex sites -- per 100,000 females for Cervix Uteri; Corpus Uteri & Uterus, NOS; and Ovary; per 100,000 males for Prostate

<sup>3</sup> Data for 1995-1998 have been modified using the comparability ratios.



## APPENDIX IV

### AGE-SPECIFIC INCIDENCE RATES<sup>1</sup> for Selected Cancer Sites by Sex Massachusetts, 1995-1999

<u>Cancer Site / Type</u>	<u>Age Group</u>	<u>Males</u>	<u>Females</u>	<u>Total</u>
<b>All Sites</b>	0-19	16.32	16.16	16.24
	20-44	74.67	125.25	100.15
	45-64	736.02	729.80	732.80
	65-74	2740.27	1584.29	2092.78
	75-84	3539.04	2079.73	2620.06
	85+	3197.50	1864.35	2208.07
<b>Brain &amp; Central Nervous System</b>	0-19	2.67	2.66	2.67
	20-44	3.88	3.13	3.50
	45-64	12.25	7.72	9.91
	65-74	27.71	17.77	22.14
	75-84	29.46	19.30	23.06
	85+	16.16	10.06	11.63
<b>Breast</b>	0-19	0.00	0.00	0.00
	20-44	0.11	46.24	23.35
	45-64	2.25	295.84	154.07
	65-74	6.23	468.46	265.14
	75-84	10.13	521.23	331.99
	85+	9.43	422.28	315.84
<b>Bronchus &amp; Lung</b>	0-19	0.05	0.10	0.07
	20-44	4.37	4.78	4.57
	45-64	111.06	90.02	100.18
	65-74	473.44	283.95	367.30
	75-84	616.89	318.03	428.69
	85+	439.08	162.36	233.71
<b>Cervix Uteri</b>	0-19	----	0.05	----
	20-44	----	9.26	----
	45-64	----	14.66	----
	65-74	----	14.83	----
	75-84	----	14.67	----
	85+	----	11.70	----
<b>Colon / Rectum</b>	0-19	0.00	0.10	0.05
	20-44	5.04	4.62	4.83
	45-64	73.96	56.32	64.84
	65-74	329.81	203.34	258.97
	75-84	547.85	381.79	443.28
	85+	611.48	427.43	474.88

<sup>1</sup> per 100,000

**Massachusetts, 1995-1999**

<b><u>Cancer Site / Type</u></b>	<b><u>Age Group</u></b>	<b><u>Males</u></b>	<b><u>Females</u></b>	<b><u>Total</u></b>
<b>Corpus Uteri &amp; Uterus, NOS</b>	0-19	----	0.05	----
	20-44	----	4.64	----
	45-64	----	60.15	----
	65-74	----	103.83	----
	75-84	----	106.34	----
	85+	----	62.23	----
<b>Esophagus</b>	0-19	0.00	0.00	0.00
	20-44	0.56	0.14	0.35
	45-64	16.58	2.74	9.42
	65-74	49.19	10.76	27.66
	75-84	53.66	18.20	31.33
	85+	55.22	20.35	29.34
<b>Hodgkin's Disease</b>	0-19	1.36	1.14	1.25
	20-44	5.14	4.30	4.72
	45-64	4.33	2.28	3.27
	65-74	6.33	3.99	5.02
	75-84	5.63	4.19	4.72
	85+	6.73	3.74	4.51
<b>Kidney &amp; Renal Pelvis</b>	0-19	0.70	0.66	0.68
	20-44	2.64	1.48	2.05
	45-64	27.39	13.87	20.40
	65-74	66.52	35.70	49.26
	75-84	95.87	39.60	60.44
	85+	58.59	32.05	38.89
<b>Larynx</b>	0-19	0.00	0.00	0.00
	20-44	0.66	0.14	0.40
	45-64	16.90	4.01	10.24
	65-74	44.94	9.62	25.15
	75-84	47.47	7.17	22.09
	85+	26.94	3.74	9.72
<b>Leukemia</b>	0-19	3.93	4.08	4.00
	20-44	3.38	2.40	2.89
	45-64	15.31	10.31	12.72
	65-74	45.56	26.32	34.79
	75-84	80.49	35.19	51.96
	85+	79.47	51.00	58.34

<sup>1</sup> per 100,000

**AGE-SPECIFIC INCIDENCE RATES<sup>1</sup> for Selected Cancer Sites by Sex  
Massachusetts, 1995-1999**



<b><u>Cancer Site / Type</u></b>	<b><u>Age Group</u></b>	<b><u>Males</u></b>	<b><u>Females</u></b>	<b><u>Total</u></b>
<b>Liver &amp; Intrahepatic Bile Ducts</b>	0-19	0.27	0.20	0.24
	20-44	0.95	0.17	0.56
	45-64	10.52	2.40	6.32
	65-74	28.54	9.54	17.89
	75-84	32.83	13.13	20.42
	85+	28.28	14.74	18.23
<b>Melanoma of Skin</b>	0-19	0.27	0.56	0.41
	20-44	6.81	8.62	7.72
	45-64	29.44	20.65	24.89
	65-74	63.30	28.61	43.87
	75-84	97.00	38.72	60.30
	85+	92.26	37.67	51.74
<b>Multiple Myeloma</b>	0-19	0.00	0.00	0.00
	20-44	0.32	0.32	0.32
	45-64	7.62	5.60	6.57
	65-74	23.14	15.89	19.08
	75-84	41.65	23.61	30.29
	85+	34.35	19.65	23.44
<b>Non-Hodgkin's Lymphoma</b>	0-19	1.80	1.19	1.50
	20-44	8.23	5.25	6.73
	45-64	30.81	21.71	26.11
	65-74	77.11	62.35	68.84
	75-84	125.89	90.57	103.65
	85+	132.67	75.33	90.11
<b>Oral Cavity &amp; Pharynx</b>	0-19	0.36	0.25	0.31
	20-44	3.06	1.60	2.33
	45-64	34.33	11.89	22.72
	65-74	67.04	26.16	44.14
	75-84	73.92	30.56	46.61
	85+	70.04	31.58	41.50
<b>Ovary</b>	0-19	----	0.84	----
	20-44	----	7.46	----
	45-64	----	32.24	----
	65-74	----	52.08	----
	75-84	----	58.25	----
	85+	----	40.94	----

<sup>1</sup> per 100,000

**AGE-SPECIFIC INCIDENCE RATES<sup>1</sup> for Selected Cancer Sites by Sex  
Massachusetts, 1995-1999**

<b><u>Cancer Site / Type</u></b>	<b><u>Age Group</u></b>	<b><u>Males</u></b>	<b><u>Females</u></b>	<b><u>Total</u></b>
<b>Pancreas</b>	0-19	0.00	0.00	0.00
	20-44	0.82	0.52	0.67
	45-64	15.60	10.49	12.96
	65-74	54.59	44.25	48.80
	75-84	80.11	64.64	70.37
	85+	92.93	73.46	78.48
<b>Prostate</b>	0-19	0.02	----	----
	20-44	1.06	----	----
	45-64	230.91	----	----
	65-74	1047.85	----	----
	75-84	1009.57	----	----
	85+	730.68	----	----
<b>Stomach</b>	0-19	0.02	0.03	0.02
	20-44	1.03	0.90	0.97
	45-64	14.62	5.63	9.97
	65-74	50.33	20.78	33.78
	75-84	83.87	37.73	54.81
	85+	125.26	55.91	73.79
<b>Testis</b>	0-19	0.87	----	----
	20-44	11.99	----	----
	45-64	4.79	----	----
	65-74	1.25	----	----
	75-84	1.88	----	----
	85+	0.00	----	----
<b>Thyroid</b>	0-19	0.12	0.66	0.38
	20-44	3.21	11.67	7.47
	45-64	6.55	13.62	10.21
	65-74	8.51	10.19	9.45
	75-84	6.38	10.37	8.89
	85+	6.06	8.19	7.64
<b>Urinary Bladder</b>	0-19	0.00	0.03	0.01
	20-44	1.30	0.59	0.94
	45-64	28.66	9.28	18.64
	65-74	127.44	33.90	75.05
	75-84	236.77	59.02	124.83
	85+	270.72	66.68	119.28

<sup>1</sup> per 100,000

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